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PROTOCHORDATA

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14. PROTOCHORDATA

INCLUDING

ENTEROPNEUSTA, PTEROBRANCHIA, POGONOPHORA AND PHORONIDEA

BY

D. B. CARLISLE, M.A., D.Phil.

Since the Graptolita and the Conularida may well be closely related to the Pterobranchia important reviews of these two groups are included in this section and indexed rather fully for reference purposes. The question of their relationships is not yet, however, completely settled and until there is more agreement on the matter papers on graptolites will be indexed in the Coelenterata section, while those on Conularida will be indexed in the Mollusca section, where they have by tradition always been placed.

I.—TITLES

The year of publication is omitted where it is the same as the volume year of the "Record" namely (1956).

Direction 42. Determination of the gender to be attributed to the names of seventy-eight genera of various Classes of Invertebrates and of the six genera of the Class Urochordata placed on the "Official List of Generic Names in Zoology" in the period up to the end of 1936. *Opin. int. Comm. zool. Nom.* 1 D 1956 : 153-170.

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Codreanu, R. & Mack-Fira, V. Sur un Ascidie nouvelle de la Mer Noire, *Ctenicella amesophleba* n. sp. confondue avec la *Ct. appendiculata* (Heller) 1877. *C.R. Acad. Sci., Paris* 242 22 : 2665-2668 1 fig.

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Godeaux, J. Blastogenèse du système nerveux chez le pyrosome. *Ann. Soc. zool. Belg.* **86** : 281-301 10 figs.

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Griffiths, D. E. *see* Morrison, J. F.

Hempelmann, F. Morphologie und Entwicklungsgeschichte der Wirbellosen. *Fortschr. Zool.* **7** 1941 : 63-103.

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Hirai, E. & Tsubata, B. On the spawning of an ascidian, *Halocynthia roretzi* (Drasche). *Bull. mar. biol. Sta. Asamushi* **8** 1 : 1-4 1 fig.

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Kümmel, G. Die Feinstruktur des Gehäuses der Appendikularien (*Oikopleura dioica* Fol.) und des Mantels der Ascidien larven (*Botryllus schlosseri* Pall). *Zool. Beitr., Berl.* **2** : 431-439 9 figs.

Mack-Fira, V. *see* Codreanu, R.

Marshall, F. H. A. & Others. [Edit. A. S. Parkes]. Physiology of reproduction. **1** London : (Longmans Green) 3rd edit. pp. xix+688 text illust.

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Pérès, J. N. (2). Résultats scientifiques des campagnes de la Calypso. III. Etudes sur l'îlot du Grand Coglone (Archipel de Rion, près Marseille). VII. Ascidiées. *Ann. Inst. océanogr. N.S.* **32** : 231-232.

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II.—SUBJECT INDEX

References to "Titles" is by names of the Author(s).

GRAPTOLITA

GENERAL

Textbooks.—WATERLOT (2).

STRUCTURE

WATERLOT (2).

EVOLUTION

Phylogeny. — WATERLOT (2).

DISTRIBUTION

FOSSIL

Cambrian to Carboniferous. — WATERLOT (2).

BRACHIATA

POGONOPHORA

GENERAL

Collections.—KIRKEGAARD (2).

STRUCTURE

Adult. — HEMPELMAN ; JÄGERSTEN ; KIRKEGAARD (2) ; REISINGER.

Exoskeleton.—JÄGERSTEN.

Integument.—JÄGERSTEN.

Muscles.—JÄGERSTEN.

Circulatory system.—JÄGERSTEN.

Coelom.—JÄGERSTEN.

Nervous system.—JÄGERSTEN.

Reproductive system. — JÄGERSTEN.

PHYSIOLOGY

Nutrition.—JÄGERSTEN.

DEVELOPMENT

Embryology. — HEMPELMAN ; REISINGER.

EVOLUTION

Phylogeny. — HEMPELMAN, JÄGERSTEN ; REISINGER ; ULRICH.

ECOLOGY

Distribution. — KIRKEGAARD (2).

DISTRIBUTION

NORTH TEMPERATE — East Atlantic : JÄGERSTEN ; East Pacific : KIRKEGAARD (2).

TROPICAL. — East Pacific : KIRKEGAARD (2).

PHORONIDEA

ECOLOGY

Distribution.—IVANOV.

DISTRIBUTION

NORTH TEMPERATE. — West Pacific : IVANOV.

CONULARIDA

Fossils of the Palaeozoic apparently related to Pterobranchia and Graptolita, TERMIER TERMIER.

PTEROBRANCHIA

GENERAL

Textbooks.—WATERLOT (1).

STRUCTURE

Fossils.—WATERLOT (1).

DISTRIBUTION

FOSSIL

Cambrian. — Upper Tremadoc of Poland : WATERLOT (1).

Cretaceous.—WATERLOT (1).

Eocene.—WATERLOT (1).

Lutetian.—Paris region : WATERLOT (1).

ENTEROPNEUSTA

GENERAL

Fauna lists.—THOMAS (2).

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Spawning.—BURDON-JONES.

Breeding season.—BURDON-JONES.

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ECOLOGY

Habitat.—BURDON-JONES.

DISTRIBUTION

SOUTH TEMPERATE. — South Australia : THOMAS (2).

TUNICATA

GENERAL

Textbooks.—BUDDENBROCK.

Collections. — Ascidiacea : BREWIN (1, 4) ; MILLAR (2) ; PÉRÈS (1, 2, 3) ; Larvacea : TOKIOKA (1, 2).

Fauna Lists. — Ascidiacea : BREWIN (1, 4) ; DAY & MORGAN ; PÉRÈS (1, 2) ; Larvacea : TOKIOKA & SUÁREZ CAABRO.

Vernacular names. — Ascidiacea : TOKIOKA (7).

Keys. — Ascidiacea of Mediterranean : PÉRÈS (1).

STRUCTURE

Adult. — Ascidiacea : BREWIN (2, 3) ; of *Octacnemus* : MILLAR (1).

Larva and post-larva.—Ascidiacea : BREWIN (2, 3) ; HIRAI.

Exoskeleton. — Ascidiacea and Larvacea : KÜMMEL.

Heart. — Ascidiacea : KRIJSMAN.

Endocrine organs. — Ascidiacea : SCHARRER.

Biochemistry.—Ascidiacea : pterine pigments, ZIEGLER-GÜNDER.

Homology. — Ascidiacea : sub-neural gland : SCHARRER ; Larvacea : house : KÜMMEL.

House of Larvacea.—KÜMMEL.

PHYSIOLOGY

Feeding mechanisms. — BUDDENBROCK.

Circulatory system, blood and heart. — Ascidiacea : EBARA (1-3) ; KRIJSMAN ; D. A. WEBB ; Salpida : D. A. WEBB.

Nervous system. — Ascidiacea : EBARA (1-3).

Growth.—Ascidiacea : SABBADIN (1, 2).

Biochemistry. — Ascidiacea : BAYER ; BUDDENBROCK ; DURANTE ; MORRISON *et al.* ; D. A. WEBB ; ZIEGLER-GÜNDER ; Larvacea : D. A. WEBB.

Pigments. — Ascidiacea : ZIEGLER-GÜNDER.

Enzymes. — Ascidiacea : BERG ; DURANTE.

Phagocytosis. — Pyrosomida : GODEAUX.

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Vicinity. — Ascidiacea : BREWIN (2).

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Brood - pouch. — Ascidiacea : BREWIN (2).

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Cleavage. — Ascidiacea : BERG ; ORTOLANI.

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Chemical embryology. — Ascidiacea : BERG, ORTOLANI; REVERBERI; VICENTIS; Pyrosomida : GODEAUX.

Organogeny. — Ascidiacea : BREWIN (2); DURANTE; REVERBERI; VICENTIS; Pyrosomida : GODEAUX.

Larval Stages. — Ascidiacea : HIRAI; Pyrosomida : GODEAUX.

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Variation. — Ascidiacea : SABBADIN (3).

Genetics. — Ascidiacea : SABBADIN (3).

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Ecology. — Ascidiacea : DAY & MORGAN; Larvacea : YAMAZI.

Habitat. — Ascidiacea : DAY & MORGAN.

Distribution. — Ascidiacea : BREWIN (1).

Parasitism.—Ascidiacea : GOTTO.

DISTRIBUTION

MARINE

TROPICAL. — Atlantic : Ascidiacea : MILLAR (2); Larvacea : TOKIOKA & SURÁEZ CAABRO; West Pacific : Larvacea : TOKIOKA (2); Indian Ocean : TOKIOKA (2).

SOUTH TEMPERATE.—Ascidiacea : BREWIN (1-4); KOTT.

CEPHALOCHORDATA

GENERAL

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STRUCTURE

Adult.—J. E. WEBB (1).

Biochemistry.—THOMAS (1).

PHYSIOLOGY

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Feeding.—BUDDENBROCK.

Biochemistry.—THOMAS (1).

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Breeding season, spawning.—MARSHALL *et al.*

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Variation.—J. E. WEBB (2).

ECOLOGY & HABITS

Population studies.—J. E. WEBB (2).

Burrowing.—SCHÄFER.

Distribution.—J. E. WEBB (1).

DISTRIBUTION

NORTH TEMPERATE.—Mediterranean & East Atlantic : J. E. WEBB (2).

TROPICAL. — Atlantic : J. E. WEBB (2); West Pacific and Indian Ocean : J. E. WEBB (1).

III.—SYSTEMATIC INDEX

References to the "Titles" is by the name(s) of the Author(s).

GRAPTOLITA

Related to Rhabdopleurida. — WATERLOT (2).

DENDROIDA

WATERLOT (2).

DENDROGRAPTIDAE

WATERLOT (2).

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Desmograptus, WATERLOT (2).

Dictyonema, WATERLOT (2).

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WATERLOT (2).

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WATERLOT (2).

CAMARIDAE

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WATERLOT (2).

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DICHOGRAPTIDAE

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Azygograptus, WATERLOT (2).*Bryograptus*; *B. pusillus*, WATERLOT (2).*Clonograptus*, WATERLOT (2).*Dichograptus*; *D. octobranchiata*, WATERLOT (2).*Didymograptus*, WATERLOT (2).*Holograptus*, WATERLOT (2).*Isograptus*, WATERLOT (2).*Loganograptus*; *L. logani*, WATERLOT (2).*Phyllograptus*, WATERLOT (2).*Schizograptus*; *S. reticulatus*, WATERLOT (2).*Temnograptus*, WATERLOT (2).*Tetragraptus*, WATERLOT (2).*Trochograptus*; *T. diffusus*, WATERLOT (2).

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DICRANOGRAPTIDAE

WATERLOT (2).

Dicellograptus; *D. sextans*, WATERLOT (2).*Dicranograptus*; *D. spinifer*, WATERLOT (2).

AXONOPHORA

WATERLOT (2).

DIPLOGRAPTIDAE

WATERLOT (2).

Amplexograptus subgenus of *Diplograptus*, WATERLOT (2).*Cephalograptus* subgenus of *Diplograptus*, WATERLOT (2).*Climacograptus*; *C. antiquus*; *C. modestus*, WATERLOT (2).*Diplograptus*; *D. (Amplexograptus) perexcavatus*; *D. (Cephalograptus) tubulariformes*; *D. (Glyptograptus) sinuatus*; *D. (Mesograptus) foliaceus*; *D. (Orthograptus) calcaratus*; *D. (Petalograptus) ovatus*, WATERLOT (2).*Glyptograptus* subgenus of *Diplograptus*, WATERLOT (2).*Mesograptus* subgenus of *Diplograptus*, WATERLOT (2).*Orthograptus* subgenus of *Diplograptus*, WATERLOT (2).*Petalograptus* subgenus of *Diplograptus*, WATERLOT (2).*Trigonograptus*; *T. ensiformis*, WATERLOT (2).

GLOSSOGRAPTIDAE

WATERLOT (2).

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WATERLOT (2).

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DIMORPHOGRAPTIDAE

WATERLOT (2).

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Cryptograptus; *C. murchisoni*, WATERLOT (2).*Monograptus*; *M. communis*; *M. dubius*; *M. lobiferus*; *M. priodon*; *M. tenuis*; *M. vomerinus*; *M. (Rastrites) longispinus*, WATERLOT (2).*Rastrites* subgenus of *Monograptus*, WATERLOT (2).

BRACHIATA

POGONOPHORA

HEMPELMAN; REISINGER.

ATHECANEPHRIA

SIBOGLINIDAE

Siboglinum ekmani sp. nov. Skagerak, JÄGERSTEN pp. 211-252 figs. 1-8 pl. 1-3.

THECANEPHRIA

POLYBRACHIIDAE

Galathealinum gen. nov., KIRKEGAARD (1) p. 82: type sp. *G. Bruuni*; *G. bruuni* sp. nov. Celebes Sea, KIRKEGAARD (1) p. 82 figs. 1-2.*Krampolinum* gen. nov., KIRKEGAARD (2) p. 184: type sp. *K. galatheae*; *K. galatheae* sp. nov. Panama, KIRKEGAARD (2) p. 185 fig. 3.

LAMELLISABELLIDAE

Lamellisabella zachsi, HEMPELMAN, REISINGER; from Gulf of Panama, KIRKEGAARD (2).

PHORONIDEA

Phoronis atlas of far eastern distribution, IVANOV.

CONULARIDA

Fossils of the Palaeozoic apparently related to the Pterobranchia and to the Graptolita, TERMIER & TERMIER.

CONULARIDAE

TERMIER & TERMIER.

Archaeoconularia; *A. insignis*,
TERMIER & TERMIER.

Climaconus, TERMIER & TERMIER.

Conularia; *C. gracilis*; *C. loculata*;
C. ornata; *C. pyramidata*; *C. quadri-*
sulcata, TERMIER & TERMIER.

Eoconularia, TERMIER & TERMIER.

Mesoconularia; *M. arcuata*, TER-
MIER & TERMIER.

Metaconularia, TERMIER & TER-
MIER.

Plectoconularia, TERMIER &
TERMIER.

Pseudoconularia, TERMIER &
TERMIER.

CONULARIELLIDAE

TERMIER & TERMIER.

Conulariella, TERMIER & TER-
MIER.

SERPULITIDAE

TERMIER & TERMIER.

Serpulites; *S. angustifolius*, TER-
MIER & TERMIER.

CONULARIDA, incertae sedis

Coleolus, TERMIER & TERMIER.

Coleoprion, TERMIER & TERMIER.

Hyttilloconularia, TERMIER &
TERMIER.

PTEROBRANCHIA

RHABDOPLEURIDAE

Fossil, WATERLOT (1).

Rhabdopleura normanni fossil,
WATERLOT (1).

EOCEPHALODISCIDAE

Eocephalodiscus fossil of Cambrian,
WATERLOT (1).

CEPHALODISCIDAE

Cephalodiscus sp. fossil, WATERLOT
(1).

ENTEROPNEUSTA

Key to genera and species of
British and neighbouring seas, BUR-
DON-JONES.

HARRIMANIDAE

Protoglossus koehleri, BURDON-
JONES.

Saccoglossus apantesis sp. nov.
South Australia, THOMAS (2) pp.
167-176 figs. 1-8; *S. bournei*; *S.*
cambrensis; *S. carabaicus*; *S. gur-*
neyi; *S. horsti*; *S. inhacensis*; *S.*
kowalevskii; *S. mereschkowskii*; *S.*
otagoensis; *S. pusillus*; *S. pygmaeus*;
S. ruber; *S. serpentinus*; *S. sulcatus*,
THOMAS (2).

BALANOGLOSSIDAE

Balanoglossus australiensis and *B.*
carnosus from South Australia,
THOMAS (2).

Glossobalanus hedleyi from South
Australia, THOMAS (2).

PTYCHODERIDAE

Ptychodera escholtz = *P. pelsarti*,
THOMAS (2); *P. flava* and *P. pelsarti*
from South Australia, THOMAS (2).

TUNICATA

ASCIDIACEA

CLAVELINIDAE

Atapozoinae sub-fam. nov., BREWIN
(3) p. 31.

Atapozoa gen. nov., BREWIN (3)
pp. 31-2 fig. 1: type sp. *A. marshi*;
A. marshi sp. nov. West Australia,
BREWIN (3) pp. 31-2 fig. 1.

Clavelina feminine gender, Direc-
tion 42, heart, KRIJGSMAN; *C.*
della-vallei and *C. lepadiformis* from
Tunisia, PÉRÈS (1).

Colella kanzasi = *Sycozoa kanzasi*,
TOKIOKA (7).

Distaplia feminine gender, Direc-
tion 42; *D. stylifera* from Tunisia,
PÉRÈS (1).

Sycozoa kanzasi, TOKIOKA (7).

POLYCITORIDAE

Cystodytes dellechiaiei in Chatham
Islands, BREWIN (1), in Tunisia,
PÉRÈS (1).

Distoma parvum = *Eudistoma par-*
vum, TOKIOKA (7).

Eudistoma banyulense, PÉRÈS (1);
E. costai and *E. mucosum* from
Tunisia, PÉRÈS (1); *E. paesteroides*
in Mediterranean, PÉRÈS (1); *E.*
planum and *E. plumbeum* from

Tunisia, PÉRÈS (1); *E. posidonaria* and *E. rubrum* in Mediterranean, PÉRÈS (1); *E. tridentatum* from Tunisia, PÉRÈS (1).

Hypsistozoa fasmeriana growth and development, BREWIN (2).

Paradistoma adriaticum and *P. cristallinum* from Tunisia, PÉRÈS (1).

Polycitor mutabilis heart-beat, EBARA (1-3), KRIJGSMAN; *P. lüderitzi* from Sierra Leone, MILLAR (2).

Rhombifera gen. nov., PÉRÈS (1) p. 276: type species *R. caerulea*; *R. caerulea* sp. nov. Tunisia, PÉRÈS (1) pp. 276-7 fig. 2.

POLYCLINIDAE

Amaroucium albicans in Mediterranean; *A. a.* var. *tridentatum* from Tunisia; *A. anceps*; *A. aureum* = *A. proliferum*, PÉRÈS (1); *A. benhami* from Chatham Islands, BREWIN (1); *A. brementi* in Mediterranean; *A. caliculatum* from Tunisia; *A. commune* = *A. proliferum*; *A. conicum* = *A. caliculatum*; *A. cristallinum* = *A. mediterraneum*; *A. densum* in Mediterranean; *A. fimbriatum* = *A. proliferum*; *A. fuscum* Heiden non = *A. fuscum* von Drasche, PÉRÈS (1); *A. fuscum* von Drasche in Mediterranean, PÉRÈS (1), near Marseille, PÉRÈS (2); *A. haouarianum* sp. nov. Tunisia, PÉRÈS (1) p. 291 fig. 9; *A. hyalinum* sp. nov. Tunisia PÉRÈS (1) p. 293 fig. 10; *A. knoxi* sp. nov. Chatham Islands, BREWIN (1) pp. 125-6 fig. 2; *A. lobatum* and *A. mediterraneum* from Tunisia, PÉRÈS (1); *A. mernooensis* sp. nov. Chatham Rise, South Pacific, BREWIN (1) pp. 132-4 fig. 4; *A. nordmanni* in Mediterranean; *A. picardi* = *A. caliculatum*, PÉRÈS (1); *A. pliciferum*, TOKIOKA (7); *A. profundum* in Mediterranean; *A. proliferum* in Mediterranean and from Tunisia, PÉRÈS (1); *A. pseudolobatum* sp. nov. Tunisia, PÉRÈS (1) pp. 293-4 fig. 11; *A. robustum* = *A. proliferum*; *A. A. rodriguezi* = *A. proliferum*, PÉRÈS (1); *A. roseum*, TOKIOKA (7); *A. scabellum* from Chatham Islands, BREWIN (1); *A. siphonum* sp. nov. Chatham Islands, BREWIN (1) p. 125 fig. 2; *A. torquatum* = *A. proliferum*; *A. tremulum* = *A. lobatum*; *A. tridentatum* = *A. albicans* var. *tridentatum*;

A. willi = *A. proliferum*; *A. (Parascidia) areolatum* from Tunisia, PÉRÈS (1), near Marseille, PÉRÈS (2).

Aplidium, PÉRÈS (1).

Macroclinum calypsonis sp. nov. Tunisia, PÉRÈS (1) p. 288 figs. 7-8; *M. duboscqui* from Tunisia, PÉRÈS (1); *M. d.* var. *orientale* var. nov. Tunisia, PÉRÈS (1) pp. 287-8 fig. 6; *M. lacazei*, *M. pulmonaria* and *M. vitreum* in Mediterranean, PÉRÈS (1).

Polyclinella azemai from Tunisia, PÉRÈS (1); *P. a.* var. *incolor* var. nov. Tunisia, PÉRÈS p. 286 fig. 5.

Polyclinum aurantium from Tunisia, PÉRÈS (1); *P. a.* var. *joalense* from Sierra Leone, MILLAR (2); *P. clavatum* = *Synoicum clavatum*, TOKIOKA (7); *P. michaelsoni* sp. nov. Chatham Rise, South Pacific, BREWIN (1) p. 132 fig. 4; *P. sluiteri* sp. nov. Chatham Islands, BREWIN (1) p. 124 fig. 2; *P. snamoti* and *P. suamoti* = *Sidneioides snamoti*, TOKIOKA (7).

Pseudodistoma cyrnusense from Tunisia, PÉRÈS (1), near Marseille, PÉRÈS (2).

Sidneioides snamoti, TOKIOKA (7). *Synoicum*, PÉRÈS (1); *S. argus*, PÉRÈS (2); *S. clavatum*, TOKIOKA (7); *S. herdmani* sp. nov. Chatham Islands, BREWIN (1) pp. 123-4 fig. 1.

DIDEMNIDAE

Didemnoidea tigrinum = *Leptoclinides tigrinum*, TOKIOKA (7).

Didemnopsis inarmata from Tunisia, PÉRÈS (1).

Didemnum candidum from Chatham Islands, BREWIN (1), from Tunisia, PÉRÈS (1); *D. canum* = *D. candidum*; *D. dentatum* from Tunisia, PÉRÈS (1); *D. d.* var. *labiatum* var. nov. Tunisia, PÉRÈS (1) p. 280 fig. 3; *D. fulgens* and *D. lahillei* from Tunisia, PÉRÈS (1); *D. lithostratum* sp. nov. Chatham Islands and Chatham Rise, BREWIN (1) p. 127 fig. 3; *D. maculosum* from Tunisia, PÉRÈS (1), near Marseille, PÉRÈS (2); *D. (D.) misakiense*, TOKIOKA (7); *D. mortensenii* from Chatham Islands and Chatham Rise, BREWIN (1); *D. (D.) moseleyi*, TOKIOKA (7).

Diplosoma gelatinosum from Venice PÉRÈS (3); *D. listerianum* from Tunisia, PÉRÈS (1); *D. mitsukurii* = *Leptoclinides mitsukurii*, TOKIOKA (7).

Leptoclinides auranticus sp. nov. Chatham Rise, South Pacific, BREWIN (1) p. 134 fig. 4; *L. marmoreus* sp. nov. Chatham Islands, BREWIN (1) p. 129-130 fig. 3.

Leptoclinum album = *Didemnum* (*Didemnum*) *moseleyi*, TOKIOKA (7); *L. mitsukurii*, TOKIOKA (7).

Lissoclinum bataillonii and *L. pseudoleptoclinum* from Tunisia, PÉRÈS (1); *L. pseudoleptoclinum* from Venice PÉRÈS (3).

Polysyncraton lacazei from Tunisia, PÉRÈS (1).

Sarcodidemnoides genus abandoned, TOKIOKA (7); *S. misakiense* type and only species of genus = *Didemnum* (*Didemnum*) *moseleyi*, TOKIOKA (7).

Trididemnum fallax, PÉRÈS (1); *T. tenerum* from Tunisia, PÉRÈS (1).

DIAZONIDAE

Diazona feminine gender, Direction 42.

Rhopalaea neapolitana from Tunisia, PÉRÈS (1).

Rhopalopsis hartmeyeri from Tunisia, PÉRÈS (1).

Syndiazona grandis, TOKIOKA (7).

CIONIDAE

Ciona heart, KRIJGSMAN; *C. intestinalis*, TOKIOKA (7), from Tunisia, PÉRÈS (1), near Marseille, PÉRÈS (2), from Venice, PÉRÈS (3).

PEROPHORIDAE

Ecteinascidia turbinata from Tunisia, PÉRÈS (1), from Sierra Leone, MILLAR (2).

Perophora heart, KRIJGSMAN; *P. japonica*, TOKIOKA (7); *P. listeri* from Tunisia, PÉRÈS (1), from Venice, PÉRÈS (3).

CORELLIDAE

Chelyosoma dofleini = *C. sibogae*, TOKIOKA (7); *C. sibogae*, TOKIOKA (7); *C. siboga*, TOKIOKA (7), larva described, HIRAI.

Corella eumyota from Chatham Islands, BREWIN (1); *C. japonica* TOKIOKA (7); *C. j.* var. *asamusi*, TOKIOKA (7); larva described HIRAI.

Megalodicopia hians, TOKIOKA (7).

Rhodosoma papillosum = *R. turcicum*, TOKIOKA (7); *R. turcicum*, TOKIOKA (7); *R. verecundum* from Tunisia, **non** = *Phallusia turcica*, PÉRÈS (1).

ASCIDIIDAE

Ascidia heart, KRIJGSMAN; *A. ahodori*, TOKIOKA (7); *A. aspersa* from Tunisia, PÉRÈS (1); *A. conchilega* host of *Doropygus psyllus*, GOTTO; *A. mentula* from Tunisia, PÉRÈS (1); *A. sydneyensis* from Sierra Leone, MILLAR (2); *A. virginea* from Tunisia, PÉRÈS (1).

Ascidiella heart, KRIJGSMAN; *A. aspersa* host of *Doropygus psyllus*, GOTTO; *A. pellucida* from Tunisia, PÉRÈS (1).

Phallusia heart, KRIJGSMAN; *P. fumigata* host of *Doropygus psyllus* GOTTO; *P. f.* forma *chloraea* near Marseille, PÉRÈS (2); *P. mammillata* from Tunisia, PÉRÈS (1), development, DURANTE, ORTOLANI, REVERBERI, VINCENTIS, vanadium in blood, BAYER; *P. turcica* **non** = *Rhodosoma verecundum*, PÉRÈS (1).

AGNESIIDAE

Agnesia himeboja, TOKIOKA (7).

OCTACNEMIDAE

Octacnemus a true ascidian, an enterogonid, description, MILLAR (1).

STYELIDAE

Alloeocarpa minuta from Chatham Islands, BREWIN (1); *A. pudentiformis* from Gambia, MILLAR (2).

Amphicarpa michaelsoni sp. nov. Chatham Rise, South Pacific, BREWIN (1) p. 134-5 fig. 4.

Asterocarpa cerea from Chatham Islands, BREWIN (1).

Botrylloides aurantium and *B. aurantium* = *B. violaceum*, TOKIOKA (7); *B. leachi* from Chatham Islands, BREWIN (1); *B. violaceum*, TOKIOKA (7).

Botryllus masculine gender, Direction 42; *B. communis*, TOKIOKA (7); *B. schlosseri* from Tunisia, PÉRÈS (1), from Venice, PÉRÈS (3), test, KÜMMEL.

Onemidocarpa bicornuata from Chatham Islands and Chatham Rise, BREWIN (1); *O. nisotis* and *O. stewartensis* from Chatham Rise, BREWIN (1).

Distomus variolosus from Tunisia, PÉRÈS (1).

Metrocarpa leachi, PÉRÈS (1), from Venice, PÉRÈS (3).

Polycarpa cryptocarpa, TOKIOKA (7); *P. gracilis* from Tunisia, PÉRÈS (1); *P. pomaria* from Tunisia, PÉRÈS (1), from Venice, PÉRÈS (3).

Styela heart, KRIJGSMAN; *S. clava*; *S. kobaja*=*Polycarpa cryptocarpa*, TOKIOKA (7); *S. partita* from Tunisia, PÉRÈS (1); *S. plicata*, TOKIOKA (7), from Tunisia, PÉRÈS (1), from Venice, PÉRÈS (3).

Symplegma reptans, TOKIOKA (7).

Synstyela reptans=*Symplegma reptans*, TOKIOKA (7).

PYURIDAE

Culeolus littoralis sp. nov. Tasmania, KOTT pp. 59-60 figs. 1-4; *C. recumbens*; *C. sluireti*; *C. wyville-thomsoni*, KOTT.

Cynthia (?=*Halocynthia*) heart, KRIJGSMAN; *C. igaboja* = *Halocynthia igaboja*; *C. karasboja*=*Pyura vittata*; *C. michaelsoni* = *Pyura michaelsoni*; *C. mirabilis* = *Pyura mirabilis*; *C. ritteri*=*Halocynthia ritteri*; *C. roretzi*=*Halocynthia roretzi*; *C. superba*=*Halocynthia aurantium*, TOKIOKA (7).

Halocynthia aurantium; *H. igaboja*, TOKIOKA (7); *H. papillosa* from Tunisia, PÉRÈS (1), from Marseille, PÉRÈS (2); *H. ritteri*, TOKIOKA (7); *H. roretzi*, TOKIOKA (7), spawning, HIRAI & TSUBATA.

Microcosmus hartmejeri, TOKIOKA (7); *M. pedunculata* from Sierra Leone, MILLAR (2); *M. polymorphus* pterine pigments, ZIEGLER-GÜNDER; *M. sulcatus* from Tunisia, PÉRÈS (1), from near Marseille, PÉRÈS (2).

Pyura, KOTT; *P. cancellata* from Chatham Islands, BREWIN (1); *P. chathamensis* sp. nov. Chatham Islands, BREWIN (1) pp. 130-1 fig. 3; *P. michaelsoni*, TOKIOKA (7); *P. microcosmus* from Tunisia, PÉRÈS (1); *P. mirabilis*, TOKIOKA (7); *P. pulla* from Chatham Islands, BREWIN (1); *P. savignyi* from near Marseille, PÉRÈS (2); *P. squamulosa* from Tunisia, PÉRÈS (1); *P. stolonifera*, MORRISON et al.; *P. suteri* from Chatham Islands, BREWIN (1); *P. vittata*, TOKIOKA (7).

MOLGULIDAE

Ctenicella amesophleba sp. nov. Black Sea, CODREANU & MACK-FIRA pp. 2665-8 fig. 1; *C. appendiculata* formerly confused with *C. amesophleba*, CODREANU & MACK-FIRA, from Tunisia, PÉRÈS (1); *C. app. var. korotneffi* from Tunisia, PÉRÈS (1).

Eugyra adriatica from Tunisia, PÉRÈS (1).

Eugyriopsis? = *Rhizomolgula*; *E. lacazei*, PÉRÈS (1).

Molgula feminine gender, Direction 42, heart, KRIJGSMAN; *M. hannensis* from Sierra Leone, MILLAR (2); *M. impura* from Tunisia, PÉRÈS (1); *M. i. var. rheophila* var. nov. Tunisia, PÉRÈS (1) pp. 299-300 fig. 13; *M. manhattensis*, SCHARRER, from Venice, PÉRÈS (3); *M. monodi* = *M. impura*; *M. occidentalis* = *M. impura*, PÉRÈS (1); *M. occulta* from Tunisia, PÉRÈS (1); *M. zenophora*, TOKIOKA (7).

Rhizomolgula ?included in *Eugyriopsis*; *R. globularis*, PÉRÈS (1); *R. japonica*, TOKIOKA (7).

THALIACEA

PYROSOMIDA

Pyrosoma neuter gender, Direction 42, embryology, IVANOVA-KAZAS, development of C.N.S., GODEAUX; *P. ellipticum* embryology, IVANOVA-KAZAS; *P. vitjazi* sp. nov. N.W. Pacific, embryology described, IVANOVA-KAZAS pp. 1197-1202 figs. 5-8.

SALPIDA

Salpa heart, KRIJGSMAN.

LARVACEA

OIKOPLEURIDAE

Althoffia tumida not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Bathocordaerus charon not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Chunopleura microgaster not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Coecaria sub-genus of *Oikopleura*, TOKIOKA & SUÁREZ CAABRO.

Folia gracilis not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Megalocercus not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Oikopleura californica = *O. (Coecaria) graciloides*; *O. (V.) cophocerca* from Cuba; *O. (V.) parva* and *O. (V.) rufescens* from Cuba; *O. cophocerca* Fol non = *O. cophocerca* (Gegenbauer); *O. cornutogastra* = *O. (Coecaria) fusiformis* forma *cornutogastra*, TOKIOKA & SUÁREZ CAABRO; *O. dioica*, YAMAZI, house, KÜMMEL; *O. (Vexillaria) dioica* from Cuba; *O. flabellum* = *O. (Vexillaria) dioica*; *O. (Coecaria) fusiformis* and *O. (C.) f.* forma *cornutogastra* from Cuba; *O. (C.) graciloides* from Cuba; *O. (C.) longicauda* from Cuba; *O. magna* = *Stegosoma magnum*; *O. malmi* = *O. (Vexillaria) dioica*; *O. najadis* = *O. (Vexillaria) parva*; *O. (V.) parva* and *O. (V.) rufescens* from Cuba; *O. spissa* = *O. (Coecaria) longicauda*; *O. (Coecaria) longicauda*, TOKIOKA & SUÁREZ CAABRO.

Pelagopleura not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Stegosoma magnum from Cuba; *S. pellucidum* = *S. magnum*, TOKIOKA & SUÁREZ CAABRO.

Vexillaria subgenus of *Oikopleura*; *V. flabellum* = *Oikopleura (V.) dioica*; *V. speciosa* = *Oikopleura (V.) dioica*, TOKIOKA & SUÁREZ CAABRO.

FRITILLARIIDAE

Acrocerus subgenus of *Fritillaria*, TOKIOKA & SUÁREZ CAABRO.

Appendicularia cophocerca Gegenbauer = *Oikopleura (Vexillaria)*

cophocerca; *A. flabellum* = *Oikopleura (Vexillaria) dioica*; *A. sicula* not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Eurycercus subgenus of *Fritillaria*; *E. pellucidus* = *Fritillaria (Eurycercus) pellucida*, TOKIOKA & SUÁREZ CAABRO.

Fritillaria angularis probably *F. (Eurycercus) borealis*, TOKIOKA & SUÁREZ CAABRO; *F. arafaera* sp. nov. Timur or Arafura Sea, TOKIOKA (3) pp. 403–408 fig. 1; *F. (Eurycercus) borealis* and *F. (E.) b.* forma *intermedia* from Cuba; *F. borealis* Essenberg = *F. (Eurycercus) borealis* forma *intermedia*; *F. borealis* forma *ritteri* = *F. (Eurycercus) borealis*; *F. b.* forma *sargassi* = *F. (Eurycercus) borealis*; *F. borealis truncata intermedia* = *F. (Eurycercus) borealis* forma *intermedia*; *F. campila* = *F. (Acrocerus) haplostoma*; *F. claudaria* probably = *F. (Eurycercus) borealis* forma *intermedia*; *F. clava* probably = *F. (Eurycercus) borealis*; *F. delicata* probably = *F. (Acrocerus) haplostoma*; *F. dispar* = *F. (Eurycercus) borealis* forma *intermedia*; *F. (Acrocerus) formica* from Cuba; *F. (A.) forma digitata* = *F. (A.) formica*; *F. furcata* = *F. (Eurycercus) pellucida*, TOKIOKA & SUÁREZ CAABRO; *F. haplostoma* is a complex of species, TOKIOKA (3); *F. (Acrocerus) haplostoma* from Cuba; *F. limpida* = *F. (Acrocerus) haplostoma*; *F. lucibilia* = *F. (Acrocerus) haplostoma*; *F. (Eurycercus) megachile* from Cuba; *F. messanensis* = *F. (Eurycercus) borealis* forma *intermedia*; *F. (Eurycercus) pellucida* from Cuba; *F. plana* probably = *F. (Eurycercus) borealis*; *F. ritteri* = *F. (Eurycercus) borealis*; *F. sargassi* = *F. (Eurycercus) borealis*; *F. tenebra* probably = *F. (Eurycercus) borealis* forma *intermedia*; *F. tereta* probably = *F. (Acrocerus) haplostoma*; *F. trigonis* probably = *F. (Eurycercus) borealis*; *F. truncata* probably = *F. (Acrocerus) haplostoma*, TOKIOKA & SUÁREZ CAABRO.

Kowalevskia not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

Tectilaria fertilis not found in Cuba, TOKIOKA & SUÁREZ CAABRO.

CEPHALOCHORDATA

Amphioxus lanceolatus breeding season, MARSHALL *et al.*

Branchiostoma africanae, WEBB (2), *B. belcheri* from Singapore; *B. bermudae*; *B. caribaeum*; *B. floridae*; *B. indicum*; *B. lanceolatum*, WEBB (1), population studies

and phylogeny, WEBB (2); *B. leonense* phylogeny; *B. lubricus* = *B. lanceolatum*, WEBB (2); *B. malayana* sp. nov. Singapore, WEBB (1) pp. 121-3 fig. 1; *B. nigeriense* phylogeny; *B. senegalense* phylogeny; *B. takoradii* phylogeny, WEBB (2).

Dolichorhynchus, WEBB (1).